What is claimed is:

1. Fluid flow control apparatus, comprising:

a proportional fluid control valve having a fluid inlet and a fluid outlet;

a pneumatic proportional control valve in communication with said proportional fluid control valve for modulating said proportional fluid control valve;

a frictional flow element having a frictional flow element fluid inlet in fluid communication with said fluid outlet of said proportional fluid control valve and having a frictional flow element fluid outlet spaced from said frictional flow element fluid inlet, said frictional flow element creating a pressure drop between said frictional flow element fluid inlet and frictional flow element fluid outlet;

means for measuring said pressure drop;

a controller in communication with said pressure drop measuring means and with said pneumatic proportional control valve for controlling the flow of fluid through said proportional fluid control valve in response to said measured pressure drop.

2. The fluid flow control apparatus of claim 1, wherein said frictional flow element comprises a helical coil.

3. The fluid flow control apparatus of claim 1, further comprising means for sensing temperature of said fluid, and wherein said controller compares said

sensed temperature to a predetermined temperature and controls said pneumatic proportional control valve in response to said comparison.

4. The fluid control apparatus of claim 1, wherein said means for measuring said pressure drop comprises a first pressure sensor for sensing pressure of said fluid at said fluid outlet of said proportional fluid control valve and a second pressure sensor for sensing pressure of said fluid at said frictional flow element fluid outlet.

5. The fluid control apparatus of claim 4, wherein said first pressure sensor is contained in a housing integral with said proportional fluid control valve.

6. The fluid control apparatus of claim 1, further comprising a suckback valve in pneumatic communication with said pneumatic proportional control valve.

7. The fluid control apparatus of claim 1, wherein said pneumatic proportional control valve is a solenoid.

8. The fluid control apparatus of claim 1, wherein said frictional flow element fluid inlet is in fluid communication with said fluid outlet of said proportional fluid control valve such that all of the fluid flowing from said fluid outlet of said valve must enter said fluid inlet of said frictional flow element.

9. A method of controlling the dispense of fluid from a dispenser to a point of use, comprising:

providing a proportional fluid control valve having a first fluid inlet and a first fluid outlet;

providing a frictional flow element in fluid communication with said first fluid outlet, said frictional flow element creating a pressure drop;

sensing said pressure drop across said frictional flow element; and

modulating said proportional fluid control valve in response to said sensed pressure drop.

10. The method of claim 9, wherein a pneumatic proportional control valve is provided to modulate said proportional fluid control valve pneumatically.

11. The method of claim 10, further comprising holding the pneumatic proportional control valve open to allow a minimum level of purge gas to bleed from the pneumatic proportional control valve.

12. The method of claim 10, wherein there are a plurality of fluid control valves, and wherein said pneumatic proportional control valve is held open at a set level such that the pneumatic pressure supplied to each said fluid control valve offsets differences among said plurality of fluid control valves allowing each said fluid control valve to open in the same amount of time and/or with the same pressure.

13. The method of claim 10, further comprising providing a controller responsive to said measured pressure drop for controlling said pneumatic proportional control valve.

14. The method of claim 9, wherein said frictional flow element comprises a helical coil.

15. The method of claim 9, further comprising means for regulating the fluid pressure of said fluid entering said first fluid inlet.

16. A proportional fluid control valve, comprising a fluid inlet, a first annular cavity in fluid communication with said fluid inlet, an annular fluid passageway in fluid communication with said first annular cavity, a second annular cavity in fluid communication with said annular passageway, and a fluid outlet in fluid communication with said second annular cavity.

17. The proportional fluid control valve of claim 16, further comprising a pneumatic cavity in fluid communication with a pneumatic inlet, and at least one diaphragm in said first annular cavity, whereby pneumatic pressure applied to said pneumatic cavity deflects said diaphragm and opens said valve.

18. The proportional fluid control valve of claim 17, further comprising a spring that biases against said diaphragm and maintains said valve in a normally closed position until said bias is overcome by said pneumatic pressure.

19. The proportional fluid control valve of claim 16, further comprising a first sensor housing in fluid communication with said fluid outlet, said first sensor housing having a sensor housing fluid outlet;

and a second sensor housing in fluid communication with said sensor housing fluid outlet.

20. The proportional fluid control valve of claim 19, wherein said first annular cavity, said second annular cavity, said first sensor housing and said second sensor housing are an integral molded component.

21. The proportional fluid control valve of claim 19, further comprising a frictional flow element between said sensor housing fluid outlet and said second sensor housing.

22. The proportional fluid control valve of claim 16, wherein said fluid inlet defines a first horizontal plane, said fluid outlet defines a second horizontal plane, and wherein said first and second horizontal planes do not intersect.

23. A valve, comprising a valve housing having a pneumatic cavity, a pneumatic diaphragm in said pneumatic cavity adapted to deflect upon the application of pressure to said pneumatic cavity, a first valve cavity, a first diaphragm in said first valve cavity, a second valve cavity, a second diaphragm in said second valve cavity, and a spring biasing said second diaphragm to prevent fluid communication between said first and second valve cavities until said bias is overcome by said application of pressure.

24. The valve of claim 23, wherein said first and second valve cavities are annular, and wherein said first cavity is in fluid communication with a linear fluid inlet path, and said second annular cavity is in fluid communication with a linear fluid outlet path.

25. The valve of claim 24, further comprising a pressure sensor in said linear fluid outlet path.

26. The valve of claim 24, wherein fluid enters said first annular cavity from said fluid inlet path and remains therein until the pneumatic pressure applied to said pneumatic diaphragm overcomes the bias of said spring.

27. The valve of claim 24, wherein said fluid inlet path defines a first horizontal plane, said fluid outlet path defines a second horizontal plane, and wherein said first and second planes do not intersect.

28. A stacked valve assembly, comprising a first proportional fluid control valve comprising a first fluid inlet, a first annular cavity in fluid communication with said first fluid inlet, a first annular fluid passageway in fluid communication with said first annular cavity, a second annular cavity in fluid communication with said first annular passageway, a first fluid outlet in fluid communication with said second annular cavity, a first sensor housing in fluid communication with said first fluid outlet, said first sensor housing having a first sensor housing fluid outlet; and a second

sensor housing in fluid communication with said first sensor housing fluid outlet; and a second proportional fluid control valve in vertical alignment with said first proportional fluid control valve, and second proportional fluid control valve comprising: a second fluid inlet, a second annular cavity in fluid communication with said second fluid inlet, a third annular fluid passageway in fluid communication with said second annular cavity, a fourth annular cavity in fluid communication with said second annular passageway, a second fluid outlet in fluid communication with said fourth annular cavity, a third sensor housing in fluid communication with said second fluid outlet, said third sensor housing having a third sensor housing fluid outlet; and a fourth sensor housing in fluid communication with said third sensor housing fluid outlet, wherein said first and second sensor housings are in vertical alignment with said third and fourth sensor housings, respectively.

29. The stacked valve assembly of claim 28, further comprising a first restrictive flow element between said first and second sensor housings and a second restrictive flow element between said third and fourth sensor housings.

30. A valve, comprising a valve housing having a pneumatic cavity, a pneumatic diaphragm in said pneumatic cavity adapted to deflect upon the

application of pressure to said pneumatic cavity, a valve cavity, a valve diaphragm in said valve cavity, said valve diaphragm being secured to said pneumatic diaphragm, and a spring biasing said pneumatic diaphragm and said valve diaphragm to prevent fluid flow out of said valve cavity until said bias is overcome by said application of pressure.

31. The valve of claim 30, further comprising a sensor cavity.

32. The valve of claim 31, and wherein said sensor cavity is positioned above where said valve diaphragm seals.

33. The valve of claim 30, further comprising a fluid inlet tangential to said valve cavity.

34. The valve of claim 30, wherein said valve cavity is in fluid communication with a fluid inlet and a fluid outlet, and wherein said fluid inlet defines a first horizontal plane, said fluid outlet defines a second horizontal plane, and wherein said first and second planes do not intersect.

35. A method of assisting a fluid valve in terminating its dispense of fluid, comprising:

providing a fluid valve;

providing a suckback valve;

causing said fluid valve to close over a period of time; and

actuating said suckback valve during said period of time.

36. The method of claim 35, further comprising delaying, for a predetermined amount of time, the further

actuation of said suckback valve once said period of time has terminated.

37. The method of claim 35, wherein said step of actuating said suckback valve is commenced after a predetermined amount of time after said step of causing said fluid valve to close is commenced.

38. The method of claim 35, wherein said step of actuating said suckback valve is terminated before said period of time is terminated.

39. A fluid flow control apparatus, comprising:

a proportional flow valve having a fluid inlet and a fluid outlet;

a pneumatic proportional control valve in communication with said proportional flow valve for modulating said proportional flow valve;

a frictional flow element having a frictional flow element fluid inlet in fluid communication with said fluid outlet of said proportional flow valve and having a frictional flow element fluid outlet spaced from said frictional flow element fluid inlet, said frictional flow element creating a pressure drop between said frictional flow element fluid inlet and frictional flow element fluid outlet;

an upstream pressure sensor;

a downstream pressure sensor;

a controller in communication with said upstream pressure sensor, said downstream pressure sensor and said

pneumatic proportional control valve, said controller further comprising:

one or more processors;

a computer readable memory; and

a set of computer readable instructions stored on said computer readable memory and executable by the one or more processors, the set of computer readable instructions comprising instructions executable to:

receive an upstream pressure signal

receive a downstream pressure signal;

calculate an error signal;

calculate a valve control signal based on the upstream pressure signal, downstream pressure signal and error signal.

40. The apparatus of Claim 39, wherein the set of computer readable instructions further comprises instructions executable to:

receive a temperature signal; and

adjust the upstream pressure signal and the downstream pressure signal based on the temperature signal.

41. The apparatus of Claim 39, wherein the computer executable instructions further comprise instructions executable to:

calculate the error signal based on proportional, integral and derivative values for the

upstream pressure signal and the downstream pressure signal.

42. The apparatus of Claim 41, wherein the computer readable instructions further comprise instructions executable to add an error gain to the error signal.

43. The apparatus of Claim 39, wherein the computer readable instructions further comprise instructions that are executable to:

maintain one or more valve gain curves in memory;

determine a valve gain for a particular valve based on the valve gain curve associated with that valve; and

account for the valve gain when calculating the valve control signal.

44. The apparatus of Claim 39, wherein the computer readable instructions further comprise instructions executable to adaptively adjust the valve control signal based on a set of past position values.

45. The apparatus of Claim 39, wherein the set of computer readable instructions further comprise instructions executable to:

convert the valve control signal to an analog valve drive signal; and

communicate the valve drive signal to drive said pneumatic proportional control valve.

46. A device comprising a set of computer readable instructions stored on a computer readable memory and executable by the one or more processors, the set of computer readable instructions comprising instructions executable to:

receive an upstream pressure signal

receive a downstream pressure signal;

calculate an error signal;

determine a valve gain for a particular valve based on a valve gain curve associated with that valve, wherein the valve gain varies according to the position of the particular valve;

calculate a valve control signal based on the upstream pressure signal, downstream pressure signal, error signal and valve gain.

47. The device of Claim 46, wherein the set of computer readable instructions further comprises instructions executable to:

receive a temperature signal; and

adjust the upstream pressure signal and the downstream pressure signal based on the temperature signal.

48. The device of Claim 46, wherein the computer executable instructions further comprise instructions executable to:
calculate the error signal based on proportional, integral and derivative values for the upstream pressure signal and the downstream pressure signal.

49. The device of Claim 46, wherein the computer readable instructions further comprise instructions executable to add an error gain to the error signal.

50. The device of Claim 46, wherein the computer readable instructions further comprise instructions executable to adaptively adjust the valve control signal based on a set of past position values.

51. The device of Claim 46, wherein the set of computer readable instructions further comprise instructions executable to:
convert the valve control signal to an analog valve drive signal; and
communicate the valve drive signal to drive said pneumatic proportional control valve.

52. A device comprising a set of computer readable instructions stored on a computer readable memory and executable by the one or more processors, the set of

computer readable instructions comprising instructions executable to:

receive an upstream pressure signal

receive a downstream pressure signal;

calculate an error signal based on proportional, integral and derivative values for the upstream pressure signal and downstream pressure signal;

add an error gain to the error signal;

determine a valve gain for a particular valve based on a valve gain curve associated with that valve, wherein the valve gain varies according to the position of the particular valve;

calculate a valve control signal based on the upstream pressure signal, downstream pressure signal, error signal and valve gain;

adaptively adjust the valve control signal based on a set of past position values.